

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): A four-point contact ball bearing comprising:
an outer member which has a raceway surface on an inner periphery thereof,
an inner member which has a raceway surface on an outer periphery thereof,
plural balls rollably disposed in a row between these outer and inner members, and
a retainer for disposing these plural balls at equal intervals in a circumferential direction thereof, the balls being in two-point contact with each of both raceway surfaces of the outer member and the inner member, wherein
if d designates a diameter of the ball, D_p designates a diameter of a pitch circle of the plural balls disposed between both the raceway surfaces, L_1 designates a distance between centers of adjacent ones of the balls on the pitch circle, r designates a curvature radius of each of grooves serving as the raceway surfaces circumscribing the ball, and α designates a contact angle between the ball and each of the raceway surfaces of the outer and inner races,
 d , D_p , L_1 , r , and α are set in such a way as to meet the following inequalities,
respectively:

$$0.011 \leq d/D_p \leq 0.017,$$

$$1.5 \leq L_1/d \leq 2.1,$$

$$0.54 \leq r/d \leq 0.59, \text{ and}$$

$15^{\circ} \leq \alpha \leq 25^{\circ}$; and

an axial gap S_A between the outer race and the inner race, which are in contact with each other through the ball, is set in such a way as to meet the following inequality:

$-0.050 \text{ mm} \leq S_A \leq 0 \text{ mm}$,

the balls are made of engineering ceramics; and

a surface of each of the balls has Vickers hardness H_V ranging from 1300 to 2700.

2. (canceled).

3. (canceled).

4. (withdrawn): A four-point contact ball bearing comprising:

an outer member which has a raceway surface on an inner periphery thereof,

an inner member which has a raceway surface on an outer periphery thereof,

plural balls rollably disposed in a row between these outer and inner members, and

a retainer for disposing these plural balls at equal intervals in a circumferential direction thereof, the balls being in two-point contact with each of both raceway surfaces of the outer member and the inner member, wherein

the balls are made of engineering ceramics; and

a surface of each of the balls has Vickers hardness H_V ranging from 1300 to 2700.

5. (new): The four-point contact ball bearing according to claim 1, further comprising a journal box comprising an outer journal member which holds the outer member at an inner peripheral side of the outer journal member and an inner journal member which holds the inner member at an outer peripheral side of the inner journal member,

wherein each of the outer journal member and the inner journal member comprises a body and a cap axially separable from the body.

6. (new): The four-point contact ball bearing according to claim 5, wherein a shield portion extends radially inwardly the cap and from the body of the outer journal member to cover an opening between the outer member and the inner member.

7. (new): The four-point contact ball bearing according to claim 1, further comprising a journal box comprising an outer journal member which holds the outer member at an inner peripheral side of the outer journal member, and an inner journal member which holds the inner member at an outer peripheral side of the inner journal member,

wherein the outer journal member is formed integrally with the outer member and the inner journal member is formed integrally with the inner member.

8. (new): The four-point contact ball bearing according to claim 7, wherein a pair of shield portions extend radially inwardly from the inner peripheral side of the outer journal with one of the shield portions being on each side of the outer member to cover an opening between the outer member and the inner member.

9. (new): The four-point contact ball bearing according to claim 1, further comprising a journal box comprising an outer journal member which holds the outer member at an inner peripheral side of the outer journal member, and an inner journal member which holds the inner member at an outer peripheral side of the inner journal member,

wherein the outer journal member is formed integrally with the outer member and the inner journal member is formed integrally with the inner member, and

wherein the outer journal member comprises two ring members that are axially separable from one another.

10. (new): The four-point contact ball bearing according to claim 9, further comprising a shield portion extending radially inwardly from the inner peripheral side of each of the ring members of the outer journal to cover an opening between the outer member and the inner member.

11. (new): The four-point contact ball bearing according to claim 1, further comprising a journal box comprising an outer journal member which holds the outer member at an inner peripheral side of the outer journal member, and an inner journal member which holds the inner member at an outer peripheral side of the inner journal member,

wherein the outer journal member is formed integrally with the outer member and the inner journal member is formed integrally with the inner member, and

wherein the inner journal member comprises two ring members that are axially separable from one another.

12. (new): The four-point contact ball bearing according to claim 11, further comprising a pair of shield portions extend radially inwardly from the inner peripheral side of the outer journal with one of the shield portions being on each side of the outer member to cover an opening between the outer member and the inner member.